

ELECTRICAL CONNECTOR ASSEMBLY  
AND MALE CONNECTOR USED IN THE SAME

5 Field of the Invention

The present invention relates to an electrical connector assembly. More specifically, the present invention relates to a shielded electrical connector assembly which is used for high-speed digital image transmission between liquid crystal monitors and personal computer main bodies (or multimedia relay boxes), or for high-speed digital image transmission between copying machines and servers.

15 Background

Conventionally, in order to improve noise resistance in high-speed signal transmission, shielding members are generally provided on housing in which the signal contacts are provided, as is shown in Japanese Utility Model Registration No. 2542233. The electrical contact terminals are positioned inside a socket housing to form a socket connector. This connector is constructed so that this socket connector and another plug connector of similar construction are engaged and locked to each other by means of a locking part. The locking part is disposed in a location that is separated from the shielding shell.

Generally, in cases where shielding shells are caused to contact each other, electrical contact parts are disposed on the shielding shells at intervals that are equal to or less than one quarter of the wavelength of the signals transmitted, in order to ensure that the electrical connection is secure and effective. For example, a construction in which a plurality of ground indents are formed at specified intervals around the engaging parts of a shielding shell part is disclosed in Japanese Utility Model

Application Kokai No. S63-172071. Furthermore, a construction in which a plurality of spring contact fingers are formed at specified intervals on the inside of a conductive shroud is disclosed in U. S. Patent No. 5,288,247. These contact parts make electrical contact with the shielding shell of the engaged male connector, so that integral electromagnetic shielding is accomplished. Except in cases where the engagement of the two connectors is maintained by frictional engagement, the locking part is disposed in a separate position so that it does not affect the electrical contact parts of these shielding shells.

Furthermore, a locking device in which a plate member is bent outward so that an operating part that is pressed by the fingers is formed on the connector cover is disclosed in Japanese Utility Model Application Kokai No. H3-116674. In the case of this operating part, the plate member is bent in an approximate C shape and caused to protrude from the surface of the connector cover.

In cases where the locking part is installed in a position that is separated from the shielding shell, the problem of an increase in the size of the connector itself arises. Especially in the case of compact devices such as notebook-type personal computers, the space of the connector is limited, so that any extra space required by the shielding can create a major problem. Furthermore, if a construction in which the locking part and shielding shells interfere with each other is adopted in order to reduce the size of the connector, it becomes difficult to maintain the integrity of the contact parts that cause the shielding shells to contact each other at a specified spacing so that the desired shielding performance can be obtained. In the case of the connector disclosed in Japanese Utility Model Application Kokai No. H3-116674, the operating part

protrudes, so that it is difficult to use this connector in places where the installation space is restricted.

The present invention was devised in light of the above-mentioned points. The object of the present invention 5 is to provide an electrical connector assembly which makes it possible to obtain the desired shielding performance while being compact in size.

Summary of the Invention

10 The electrical connector assembly of the present invention has a male connector and a female connector, each of which has an insulating housing that holds contacts, and a shielding shell that is externally mounted on the respective insulating housing. The connectors are engaged with each other and locked to each other. The male connector has a latching arm with a first engaging part. This engaging part has electrical continuity with the shielding shell of the male connector. The female connector has another or second engaging part which has electrical continuity with the shielding shell of the female connector, and which engages with the first engaging part. Both of the shielding shells respectively have a plurality of contact parts which are disposed in the direction perpendicular to the direction of insertion of the connectors, and which 15 contact each other when the connectors are engaged with each other. The first engaging part and the second engaging part act in conjunction to form a portion of the contact parts, so that the plurality of contact parts as a whole are disposed at equal intervals in the direction perpendicular 20 to the direction of insertion of the connectors. The term "equal intervals" also includes cases in which there is some variation in dimensions, in addition to cases of completely 25 equal intervals.